

APPENDIX C

ECONOMIC ASSESSMENT

FOR THE

PHASE II, REPORT

DREDGED MATERIAL MANAGEMENT PLAN

UPPER SAGINAW RIVER, MICHIGAN

APPENDIX C ECONOMIC ASSESSMENT

TABLE OF CONTENTS

<u>Item</u>	<u>Page</u>
Introduction.....	C-1
Benefit Indicators.....	C-1
Cost Indicators	C-6
Economic Justification.....	C-10

LIST OF TABLES

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Tonnage Data, Saginaw River, 1991 to 2001	C-2
2	Freight Traffic Comparisons, 1996 to 2001	C-3
3	Trips and Drafts of Vessels, Comparison 1996 and 2001	C-4
4	Saginaw Benefit Indicators	C-6
5	Channel Maintenance Dredging Cost History	C-7
6	Construction Costs.....	C-8
7	Total Annual Project Maintenance Cost for Select Years and for Proposed Project.....	C-9

APPENDIX C ECONOMIC ASSESSMENT

INTRODUCTION

The Saginaw River is formed by the union of the Tittabawassee and Shiawassee Rivers. Saginaw River is 22 miles long and flows northerly into the extreme inner end of Saginaw Bay, Lake Huron. The outer portion of the channel in Saginaw Bay is currently maintained at a depth of 27 feet from Low Water Datum (LWD) and a width of 350 feet for 14 miles; and at a 26-foot depth from LWD with a width of 250-350 feet for 0.4 mile to the mouth of the Saginaw River. The inner channel is maintained at a depth of 25 feet from LWD with a width of 200 feet for 4.5 miles from the mouth of the Saginaw River to the Penn Central Railroad Bridge in Bay City; and at a 22 foot depth from LWD with a width of 200 feet for 13 miles from the Penn Central Railroad in Bay City to the Chesapeake and Ohio Railroad Bridge in Saginaw. The channel limits of the Upper Saginaw River DMMP study are from a point 4.7 miles upstream from the entrance of the Saginaw River to 22 miles upstream from the entrance of the Saginaw River; that is, the 22- through 25-foot deep channel portion of the Federal project.

Within the entire Saginaw River Federal project there are 31 active commercial docks handling a variety of cargo and/or offering services. Eighteen of the thirty-one commercial docks are located within the Dredged Material Management Plan (DMMP) study area. Addendum C-1 lists the dock facilities for the Saginaw River. The commodity facilities handle primarily coal, petroleum, chemicals, fertilizer, potash, salt, grain, and stone. The service facilities offer vessel repair, a mooring station for the U.S. EPA where passenger vessels berth.

BENEFIT INDICATORS

According to the Corps' *Waterborne Commerce of the United States, Part 3 - Waterways and Harbors Great Lakes*, vessel traffic, measured in net tons, has been up and down over the years. Through the 1950's, vessel traffic at Saginaw River averaged just over 4 million net tons annually. Vessel traffic steadily increased in the early 1960's and peaked in 1966 with a net tonnage of 7,243,288 before beginning a decline that lasted through the 1970's and early 1980's. Net tonnage at the River reached a low of 1,608,792 net tons in 1982. The mid to late 1980's saw resurgence in vessel traffic and by 1993 the net tonnage had climbed to 5,234,000. 2001 saw a 15-year high of 5,839,000 short tons.

Vessel traffic for the entire Saginaw River is presented in **Table 1** for the 10-year period of 1991 through 2001, the latest reporting period. The overall tonnage shipped on the Saginaw River has fluctuated but has remained over 5 million tons since 1993 with the exception of 1995 and 2000 where it exceeded 4.5 million tons.

<p style="text-align: center;">Table 1 Total Tonnage of Saginaw River Tonnage Data, 1991 to 2001 Saginaw Harbor</p>		
Year	Cargo Tonnage (short tons)	% Change
1991	3,895	
1992	3,789	-2.8%
1993	5,234	32.0%
1994	5,119	-2.2%
1995	4,720	-8.1%
1996	5,264	10.9%
1997	5,730	8.5%
1998	5,609	-2.1%
1999	5,290	-5.9%
2000	4,609	-13.8%
2001	5,829	23.4%

The fluctuations in tonnage and types of cargo are typical for the history of the Saginaw River and are expected to continue with tonnage fluctuating between 4.5 and 6 million short tons annually. The major shipping commodities of the Saginaw River do not follow the trends set by the remainder of the Great Lakes, thus no comparison is attempted in this report. As depicted in **Table 2**, the commodities of the Saginaw River that show increases in tonnage are those of petroleum and petroleum products, clay, slag, non-metallic minerals, cement and concrete. Coal tonnage shows a history of increasing and decreasing every other year. It is assumed that this fluctuation is due to stockpiling. Chemicals and related products have been declining in recent years. Limestone is the largest commodity on the River comprising between 57 and 66 percent of total tonnage in the past 5 years.

A 1991 Detroit District reconnaissance report assessed the feasibility of modifying the existing channel (*Reconnaissance Report Commercial Navigation Modifications Saginaw Bay and River, Michigan*, December 1991). The economic analysis for this Report examined incremental deepening options of 1 to 3 feet. For the analysis, the Saginaw River was divided into three reaches. Reach 1 was the Lower Saginaw River, while Reaches 2 and 3 were subdivisions of the Upper Saginaw River. A 3-year average of vessel traffic for the years 1987 through 1989 was computed using data from the Corps' *Waterborne Commerce of the United States, Part 3 - Waterways and Harbors Great Lakes*. For the Report, three commodity groups were established: Group 1 = coal; Group 2 = stone, nonmetallic minerals, cement, slag, fertilizers, and other; and Group 3 = petroleum products, and basic chemicals and chemical products. The trend in vessel traffic for the Saginaw River can be characterized as stable to modestly increasing.

Table 2
Freight Traffic, comparisons (thousand short tons)
Change in short tons from given year to 2001

Commodity	1996 Grand Total	1998 Grand Total	1999 Grand Total	2000 Grand Total
Total, all commodities	575 ¹	230	549	1230
Total coal	-296	32	-228	67
Total petroleum and petroleum products	254	127	136	63
Total chemicals and related products	-67	-63	-47	-29
Total crude materials, inedible except fuels	413	-50	468	1131
Subtotal soil, sand, gravel, rock and stone	-338	-624	104	638
Limestone	186	-406	53	648
Sand & gravel	-524	-212	64	1
Sculpture, clay and salt	624	452	138	240
Slag	127	104	68	67
Other non-metal, Min.	0	18	158	199
Lime, cement and glass	272	186	223	0

¹ This shows that tonnage was 575,000 short tons greater in 2001 than in 1996 for all commodities.

The composition of the fleet servicing the Saginaw River has changed in recent years, as shown in **Table 3**. Many of the commodities are shipped by U.S. Class 5 vessels (600 feet to 649 feet in length). The smallest vessels are Class 1 (under 400 feet in length) while the largest are Class 10 (950 feet to 1,000 feet in length). Canadian vessels are Class 7 (700-730 feet in length). Other foreign vessels, Salties, with an average length of 500 feet, deliver petroleum and chemical products. The Class 1 vessels, some of the Class 2 vessels and the Salties are all powered tankers or barges. Bulk freighters make up the remainder of the vessels.

Docks within the Upper Saginaw River receive coal on Class 5 through Class 10 vessels; stone, nonmetallic minerals, cement, slag, fertilizers on Class 5 and Class 7 vessels; and petroleum, chemical and chemical products on Class 1 and Class 2 vessels, as well as foreign Salties.

The drafts of the inbound and outbound vessels servicing Saginaw Harbor are compared for the years 1996 and 2001 in **Table 3**. Vessels reporting drafts of 23 to 27 feet restricting them to the

Lower Saginaw River are declining in number. Those vessels with drafts of 22 feet or less, and thus capable of using the Upper portion of the project, have been increasing during the past 10 years. Percentage changes in vessels at each draft are presented in **Table 3**. Recent data indicates that the current vessel fleet has shifted dramatically in response to less available draft. The number of vessel trips has increased from 744 in 1996 to 4,172 in 2001. This change is attributed to both the use of smaller vessels and increased shipping.

Table 3
Trips and Drafts of Vessels, Saginaw River, MI

2001		UPBOUND						DOWNBOUND						% Change from 1996
		Self Propelled Vessels				NonSelf Propelled Vessels		Self Propelled Vessels				Non-Self Propelled Vessels		
		Passenger &		Tow or		Dry Cargo	Tanker	Passenger &		Tow or		Dry Cargo	Tanker	
DRAFT	Total	Dry Cargo	Tanker	Tug	Dry Cargo	Tanker	Total	Dry Cargo	Tanker	Tug	Dry Cargo	Tanker		
Foreign & Domestic TOTAL	2057	300	18	886	830	23	2115	355	18	886	830	26		
28	-	-	-	-	-	-	3	2	-	-	1	-	-57.1%	
27	-	-	-	-	-	-	-	-	-	-	-	-	-100.0%	
26	17	-	-	17	-	-	26	9	-	17	-	-	-24.6%	
25	-	-	-	-	-	-	4	4	-	-	-	-	-88.9%	
24	5	5	-	-	-	-	21	21	-	-	-	-	-39.5%	
23	5	5	-	-	-	-	12	11	-	-	1	-	-72.1%	
22	18	15	1	2	-	-	56	39	8	1	8	-	-30.8%	
21	20	20	-	-	-	-	82	74	1	-	7	-	96.2%	
20	5	5	-	-	-	-	113	88	-	-	25	-	181.0%	
19	42	36	-	5	-	1	46	28	7	5	3	3	183.9%	
18	67	42	-	5	20	-	36	23	1	8	1	3	232.3%	
17	130	104	-	20	6	-	70	48	-	19	2	1	78.6%	
16	35	34	-	-	1	-	15	4	-	-	1	10	-36.7%	
15	32	15	13	-	4	-	5	3	-	-	1	1	42.3%	
14	21	17	-	4	-	-	2	1	-	1	-	-	475.0%	
13	2	-	-	1	-	1	2	-	-	1	-	1	-83.3%	
≤12	1,658	2	4	832	799	21	1,622	-	1	834	780	7	4585.7%	
TOTAL TRIPS													4,172	
total ≥ 23 ft. draft													93	
total ≤ 22 ft. draft													4,079	

Table 3, continued

1996	UPBOUND							DOWNBOUND					
	Self Propelled Vessels				Non-Self Propelled Vessels			Self Propelled Vessels				Non-Self Propelled Vessels	
	Passenger & Dry Cargo		Tow or Tug	Dry Cargo		Tanker	Total	Passenger & Dry Cargo		Tow or Tug	Dry Cargo		Tanker
	Total	Dry Cargo		Tanker	Tanker			Total	Dry Cargo		Tanker	Tanker	
DRAFT	Total	Dry Cargo	Tanker	Tug	Dry Cargo	Tanker	Total	Dry Cargo	Tanker	Tug	Dry Cargo	Tanker	Total
Foreign & Domestic													
Total	351	276	1	46	14	14	393	325	1	35	16	16	
27	-	-	-	-	-	-	7	6	-	-	1	-	
26	-	-	-	-	-	-	55	55	-	-	-	-	
25	-	-	-	-	-	-	36	36	-	-	-	-	
24	5	-	-	5	-	-	38	31	-	5	2	-	
23	2	2	-	-	-	-	23	16	-	-	7	-	
22	18	18	-	-	-	-	89	88	-	-	1	-	
21	10	10	-	-	-	-	42	38	-	-	4	-	
20	26	26	-	-	-	-	16	16	-	-	-	-	
19	25	25	-	-	-	-	6	5	1	-	-	-	
18	24	21	-	3	-	-	7	2	-	3	-	2	
17	88	88	-	-	-	-	24	23	-	-	-	1	
16	62	53	-	-	9	-	17	6	-	-	-	11	
15	24	24	-	-	-	-	2	2	-	-	-	-	
14	-	-	-	-	-	-	4	1	-	2	-	1	
13	14	5	-	9	-	-	10	-	-	10	-	-	
≤12	53	4	1	29	5	14	17	-	-	15	1	1	
TOTAL TRIPS													744
total ≥ 23 ft. draft													166
total ≤ 22 ft. draft													578

The benefit indicators for continued maintenance dredging are summarized in Table 4. Large shifts in commodities or tonnage are not expected, but maintaining current levels will become increasingly difficult without dredging. It is expected that, annually, docks along the Saginaw River will handle about 4 - 6 million short tons of cargo over the next ten years (2002-2012). Moreover, the portion of the overall river traffic represented by vessel traffic for the Upper Saginaw River will remain at the current level, about 70% of 5,000,000 net tons for the entire Saginaw River.

TABLE 4
SAGINAW RIVER BENEFIT INDICATORS

Benefit Indicators ¹	Current Operations (2001)	Trend	Summary/ Remarks
Commodity Types	Upper and Lower Saginaw River: 5.3% Coal; 4.9% Petroleum products; 57% Limestone; 10.7% Clay; 5.2% Non-metal; 11.4% Cement; 5.5% Other ²	Fluctuates, expected range: 4 - 6 million tons annually.	No Change
Tonnage	5 million net tons for Upper and Lower Saginaw River; 3.6 million net tons for Upper Saginaw River only	Steady	No Change
Growth Rates	None	None	No Change
Vessel Types	Bulk	Bulk	No Change
Vessel Sizes	Class 2 - Class 10, Mainly Class 5	Vessel sizes decreasing due to less available draft	Continued lack of dredging will reduce traffic
Vessel Operations	Utilizing maximum channel depths, light load	Steady	No Change

¹ Based on only pertinent indicators.

² Based on 2001 vessel traffic from Waterborne Commerce of the United States, Part 3-Great Lakes, Calendar Year 2003.

COST INDICATORS

Dredged materials from both the Upper and Lower portions of the Saginaw River have been placed at various Confined Disposal Facility Sites (CDFs): Skull Island, Middle Ground Island, and Saginaw Bay Island. As shown in **Table 5**, the Skull Island CDF was first used in 1971, and it was quickly filled to capacity. The Middle Ground Island CDF was last used in 1984. The CDF supplied material as a daily cover for a landfill adjacent to the CDF until the landfill was filled in 1984. The Saginaw Bay Island CDF was constructed and first used for disposal of dredged material in 1978. As constructed, the CDF has a maximum capacity to hold 10,000,000 cubic yards of dredged material. Since 1984, all dredged material from the Saginaw River has been placed in the Saginaw Bay Island CDF. Material from the Upper Saginaw was placed in this CDF through 1995 on an emergency basis only and it has not been dredged since 1995. This is reflected in the change in vessels using the river. It was necessary to decrease vessel size to continue shipment. The proposed plan for providing future disposal capacity for the Upper Saginaw River is to develop the Zilwaukee Township Site, West of Saginaw River. This alternative was the least costly and most environmentally acceptable of the available alternatives. Therefore, for this analysis, historic and current, as well as projected future costs associated with the Saginaw Bay Island CDF, will be compared to identify the trend in project costs, bringing all costs to 2004 dollars.

In 1978, maintenance-dredging costs were \$10.19 per cubic yard, after being adjusted to 2004 dollars (see **Table 5**). The most recent dredging occurred in 2001 at a cost of \$10.44 per cubic yard in 2004 dollars. Historical dredging costs in 2004 dollars resulted in recent costs averaging between \$5 and \$7. The new CDF proposed in this report is expected to decrease annual costs

TABLE 5
SAGINAW RIVER
CHANNEL MAINTENANCE DREDGING COST HISTORY
USING EXISTING SAGINAW CDF

Year	Cubic Yards	Total Cost	Cost/Cubic yd	Cost/Cubic Yd. in 2004 dollars**	Placement Area	Contractor or Government
1971	48,461	\$112,647	\$2.32	\$10.19	Skull Island CDF	Government
1972	86,994	\$280,479	\$3.22	\$12.76	Skull Island CDF	Government
1973	109,206	\$192,002	\$1.76	\$6.45	Middle Ground CDF	Government
1974	138,540	\$250,877	\$1.81	\$6.22	Middle Ground CDF	Government
1975	156,271	\$410,324	\$2.63	\$8.26	Middle Ground CDF	Government
1976	91,733	\$461,133	\$5.03	\$14.55	Middle Ground CDF	Government
1978*	2,362,680	\$5,248,835	\$2.22	\$5.56	Bay CDF/ Middle Ground CDF	Contractor/ Government
1979*	393,645	\$857,043	\$2.18	\$5.04	Bay CDF	Government
1980*	891,366	\$1,436,748	\$1.61	\$3.45	Bay CDF	Government
1981*	677,284	\$1,755,095	\$2.59	\$5.09	Bay CDF	Government
1982*	642,844	\$1,482,013	\$2.31	\$4.19	Bay CDF	Government
1983*	909,732	\$1,648,045	\$1.81	\$3.09	Bay CDF	Government
1984*	902,748	\$4,545,147	\$5.03	\$8.43	Bay CDF	Contractor
1985	365,275	\$2,162,575	\$5.92	\$9.80	Bay CDF	Contractor
1986-1987*	517,324	\$2,086,167	\$4.03	\$6.43	Bay CDF	Contractor
1988-1989	346,169	\$2,091,892	\$6.04	\$9.19	Bay CDF	Contractor
1990	345,409	\$1,639,719	\$4.75	\$6.97	Bay CDF	Contractor
1991	771,705	\$2,314,471	\$3.00	\$4.31	Bay CDF	Contractor
1992-1994	904,878	\$3,463,605	\$3.83	\$5.12	Bay CDF	Contractor
1995	218,500	\$2,379,000	\$6.31	\$8.01	Bay CDF	Contractor
1996	164,772	\$477,905	\$2.90	\$3.58	Bay CDF	Contractor
1997	235,949	\$910,147	\$3.86	\$4.60	Bay CDF	Contractor
1998	142,765	\$1,023,171	\$7.17	\$8.41	Bay CDF	Contractor
1999	376,136	\$756,988	\$2.01	\$2.31	Bay CDF	Contractor
2000	184,987	\$1,429,354	\$7.73	\$8.63	Bay CDF	Contractor
2001	44,861	\$427,927	\$9.54	\$10.44	Bay CDF	Contractor
Total	12,030,234	\$39,843,309	\$3.31			
10-yr avg (1991-2001)	338,284	\$1,464,730	\$4.33	\$6.16		
5-yr avg (1991-1996)	514,964	\$2,158,745	\$4.19	\$5.26		
5-yr avg (1997-2001)	196,940	909,517	\$4.62	\$6.88		

* Cubic yards combined due to multiple times dredged in one year.

**Costs adjusted using the Engineering News Record Construction Cost Index (ENR CCI)

due to the significant decrease in the distance necessary to disposed of the dredged material, a decrease of as much as 24 miles.

The total annual cost to maintain the authorized channel includes the annual cost to dredge the material as discussed above and the annual capital investment cost of the proposed CDF.

The proposed plan for the CDF at the Zilwaukee Township Site, West of Saginaw River would meet the 20-year capacity requirement of 3,100,000 total cubic yards (150,000 cubic yards per year). Total Construction and Average Annual Costs presented in **Table 6**.

Table 6
COSTS
Saginaw CDF, West

Component	Engineer's Estimate				
	Quantity	Unit	Unit Price	Cost	Subtotal
Capital Cost					
Mobilization/Demobilization	1	Each	\$50,000.00	\$50,000	
Clearing and Grubbing	8	Acres	\$2,500.00	\$20,000	
Stripping Unsuitable Material	145,000	CY	\$2.25	\$326,250	
Excavate Clay	119,000	CY	\$1.45	\$172,550	
Construct New Dikes	119,000	CY	\$2.90	\$345,100	
Install Weirs	3	Each	\$5,000.00	\$15,000	
Security Fence	15,500	LF	\$14.50	\$224,750	
Subtotal				\$1,153,650	
Subtotal Capital					\$1,153,650
INDIRECT Cost					
Engineering/Design (5% of Capital Cost)	1	Estimate	\$57,683	\$57,683	
Construction Management (6%)	1	Estimate	\$69,219	\$69,219	
Subtotal					\$126,902
Total Capital (System, Engineering) Cost					\$1,280,552
Contingency (15%)					\$192,082.73
Total Project Cost					\$1,472,634
Average Annual Cost*					\$124,510

*20-year AAC based on current interest rate of 5.625%

Amortizing the new CDF construction cost over 20 years results in an average annual cost of \$124,510. Future annual dredging cost are expected to be less than the recent averages due to the decrease in the distance required to transport the dredged material. A forecast for future dredging

expenses is not possible since dredging costs fluctuate dramatically on a year-to-year basis and the analyzing the factors affecting those costs (transportation costs, fuel costs, shipping costs) are beyond the scope of this analysis. Based on the recent averages presented in **Table 5** and the knowledge that future costs will decrease, the future annual cost of dredging is assumed to be \$5.00 per cubic yard. It is expected that approximately 300,000 cubic yards of dredged material will be removed and at an average cost of \$5.00 per cubic yard resulting in expected annual dredging costs of \$1,500,000. Thus, at 2004 price levels, the total future annual cost of the CDF construction and dredging is \$124,510 (average annual cost of the constructed CDF) plus \$1,500,000 or \$1,624,510.

The total annual project maintenance costs for years after the construction of the proposed project are summarized in **Table 7**. After adjusting for price level changes, future annual project maintenance costs are expected to be low relative to previous years. This decrease is primarily due to the significantly lower annualized construction costs of the proposed CDF as opposed to the existing CDF. Additional savings occur resulting from the dredging cost savings attributable to the decrease in distance between the CDF from the dredging site.

Table 7 Saginaw River Total Annual Project Maintenance Cost for Select Years and for Proposed Project in 2004 dollars			
	Dredging	Annual Cost of CDF*	Total Annual Cost
1978	\$13,128,232	\$617,576	\$13,745,808
1981	\$3,446,303	\$617,576	\$4,063,878
1986-87	\$3,328,675	\$617,576	\$3,946,251
1991	\$3,325,434	\$617,576	\$3,943,010
1996	\$477,905	\$617,576	\$1,095,481
2004 +	\$1,500,000	\$124,510	\$1,624,510
* Existing CDF was constructed at a 1978 cost of \$2,919,628. This cost was adjusted to 2004 dollars using the ENR CCI and amortized over 20 years using the current interest rate of 5.625% for 1978 -1996, see Table 6 for the future project annual cost calculation.			

ECONOMIC JUSTIFICATION

Table 3 presents the vessel traffic for 1996 and 2001 indicating significant increases in vessel traffic. Table 1 indicates that tonnage is relatively stable to moderately increasing. Table 7 presents historical annual costs and expected future costs of the project. In summary, both tonnage and traffic are increasing and annual costs of maintenance will decrease with the construction of the proposed CDF. Based on the benefits and costs review in this analysis, continued maintenance dredging of the authorized channel is economically justified.

ADDENDUM C-1

DOCK FACILITIES

SAGINAW RIVER
MICHIGAN

ADDENDUM C-1, DOCK FACILITIES FOR SAGINAW RIVER

NAME	LOCATION	PURPOSE
Amoco Oil Co., Bay City Terminal Wharf.	Lft bank, on lower side of slip approx. 1.8 mls above mouth	Occasional receipt of petroleum products.
Bay Aggregate, Bay City Wharf.	Rt bank, approx. 700 ft above Veterans Memorial Bridge	Receipt of stone by self-unloading vessel.
Bay Aggregate, I.B. Industrial Park Wharf.	Rt bank, approx. 0.3 mls above Veterans Memorial Bridge	Receipt of stone by self-unloading vessel.
Bay Dock Co., Wirt Saginaw Stone Wharf.	Rt bank, approx. 0.5 mls above I-75 Bridge	Receipt of stone, sand, salt, potash and coal by self-unloading vessel; shipment of stone by barge.
Burroughs Materials Corp., Saginaw Terminal Wharf.	Lft bank, approx. 0.9 mls below I-75 Bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including stone
Carrollton Concrete Mix Dock.	Lft bank, below CSX Transportation bridge	Receipt of stone by self-unloading vessel.
Carrollton Paving Co., Essexville Dock.	Rt bank, approx. 0.7 mls below Lake State Railway bridge.	Occasional receipt of limestone by self-unloading vessel.
City of Bay City, Parcel No. 10 Dock.	Rt bank, approx. 0.3 mls below Lafayette Bridge	Not used.
City of Bay City, Parcel No. 9 Dock.	Rt bank, approx. 0.5 mls below Lafayette Bridge	Not used.
City of Bay City, Wenonah Park Wharf.	Rt bank, below Veterans Memorial Bridge	Mooring U.S. Environmental Protection Agency vessels; occasional landing of passengers from excursion vessels and mooring of vessels on exhibition; mooring miscellaneous small craft.
Consumers Power Co., Essexville Wharf.	Rt bank, at mouth	
Countryside Cooperative, Saginaw Grain Terminal Wharf.	Lft bank, approx. 1.1 mls above I-75 Bridge	Receipt of coal by self-unloading vessel for plant consumption.
Dow Brands L.P., Bay City Seaway Terminal Wharf.	Lft bank, approx. 0.3 mls below Lake State Railway bridge	Occasional shipment of grain.
ESSROC Materials Inc., Aetna Cement Wharf.	Rt bank, approx. 0.8 mls below Lake State Railway bridge	Receipt of calcium chloride by barge; occasional receipt of liquid UAN fertilizer by vessel.
Fletcher Marine Terminal, Ship Wharf.	Lft bank, approx. 0.3 mls below Central MI Railway bridge	Receipt of cement clinker and occasional receipt of limestone by self-unloading vessel.
Fletcher Marine Terminal, Tugboat Wharf.	Lft bank, approx. 0.4 mls below Central MI Railway bridge	Not used. (See Remarks)
General Motors Corp., Saginaw Grey Iron Plant Wharf.	Rt bank, approx. 1.4 mls below CSX Transportation bridge	Mooring tugboat and other small craft.
International Materials, Saginaw First Street Dock.	Rt bank, approx. 0.7 mls below CSX Transportation bridge	Not used.

ADDENDUM C-1, DOCK FACILITIES FOR SAGINAW RIVER

NAME	LOCATION	PURPOSE
Lafarge Corp., Carrollton Sixth Street Wharf.	Lft bank, approx. 1.0 mls below CSX Transportation bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including stone.
Luntz Corp. Wharf.	Lft bank, approx. 1.1 mls below CSX Transportation bridge	Receipt of bulk cement by self-unloading vessel.
Peavey Co., Carrollton Elevator Wharf.	Lft bank, approx. 0.8 mls below CSX Transportation bridge	Not used.
Saginaw Asphalt Paving Co., Buena Vista Dock.	Rt bank, approx. 0.2 mls above I-75 Bridge	Shipment of grain.
Saginaw Asphalt Paving Co., Carrollton Dock.	Lft bank, approx. 0.7 mls below CSX Transportation bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including stone, sand, and salt.
Saginaw Rock Products Co., Busch Marine Dock.	Lft bank, approx. 1.0 mls above I-75 Bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including stone, sand, coal, and salt.
Saginaw Rock Products Co., Saginaw Dock.	Rt bank, approx. 0.4 mls below CSX Transportation bridge	Mooring company-owned tugboat and floating equipment.
Saginaw Valley Marine Terminal Wharf.	Rt bank, Main Channel, approx. 1.0 mls above Lafayette Bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including stone and coal.
Sand & Stone Dock.	Rt bank, approx. 0.3 mls below Lake State Railway bridge	Occasional receipt and shipment of conventional general cargo.
Sargent Docks & Terminal Co., Zilwaukee Wharf.	Lft bank, approx. 0.2 mls below I-75 Bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including limestone and potash and other fertilizers.
Total Petroleum, Bay City Terminal Wharf.	Lft bank, approx. 0.3 mls above Lake State Railway bridge	Receipt of miscellaneous dry bulk commodities by self-unloading vessel, including salt, coal, fertilizer and stone.
Triple Clean Liquifuels Wharf.	Rt bank, approx. 800 ft below Lake State Railway bridge	Receipt and shipment of petroleum products.
U.S. Army, Corps of Engineers, Saginaw Area Projects Office Wharf	Rt bank, lower side of inner end of slip, approx. 1.4 mls above river mouth	Receipt of petroleum products.
U.S. Coast Guard, Saginaw River Station Wharf.	Rt bank, upper side of inner end of slip, approx. 1.4 mls above river mouth	Mooring and fueling government-owned vessels.
Valley Asphalt Co. Dock.	Lft bank, approx. 0.3 mls below CSX Transportation bridge	Mooring, fueling and servicing U.S. Coast Guard vessels.

ADDENDUM C-1, DOCK FACILITIES FOR SAGINAW RIVER

NAME	LOCATION	PURPOSE
William W. Stender, Lower Wharf Mooring.	Lft bank, Main Channel, approx. 1.2 mls above Lafayette Bridge	Receipt of stone and sand by self-unloading vessel.
William W. Stender, Upper Wharf and Moorings.	Lft bank, Main Channel, approx. 1.3 mls above Lafayette Bridge	Mooring company-owned floating equipment. Mooring vessels for repair; mooring company-owned floating equipment.
Wirt Overseas Blending and Transfer Co. Wharf.	Rt bank, approx. 0.2 mls below Lake State Railway bridge	Occasional receipt of miscellaneous dry bulk commodities by self-unloading vessel, including fertilizer and cement clinker. (See Remarks)
Wirt Transport Co., Bay City Stone Dock.	Lft bank, approx. 350 ft above Independence Bridge	Receipt of stone, coal, and salt by self-unloading vessel, and occasional shipment of stone by barge.